

Abstract of the Disclosure

1           A spatial resolution enhancement and dynamic range  
2 extension for a Computerized Airborne Multicamera Imaging  
3 System (CAMIS). CAMIS is a multispectral imaging system for  
4 diverse manned and unmanned aerial vehicles to fly along  
5 flexible paths and altitudes for a wide variety of  
6 applications. CAMIS comprises four spectral bands of  
7 progressive scan CCD video cameras with 782 x 576 square pixels  
8 each, giving a total of 1.82 million effective pixels. These  
9 cameras are synchronized and aligned in parallel with sub-  
10 pixel-accurate spatial offsets over a common field of view. A  
11 software procedure interpolates the original four-band 782 x  
12 576 captures into 1564 x 1152 ones using a bi-linear algorithm,  
13 and then performs geometric correction and band-to-band pixel  
14 registration. The result is a more precisely registered,  
15 spatial resolution enhanced multispectral image, sized 1540(H)  
16 x 1140(V) x 4(Bytes). The CAMIS CCD cameras include a  
17 controllable electronic shutter, which permits the system to  
18 acquire a desirable range of signals by a computed exposure,  
19 and then bracket it with two additional up/down-stepped  
20 exposures into computer memory. The integrated data set of the  
21 multiple stepped exposures results in effectively extending the  
22 dynamic range of the measurement.